

Title (en)
TECHNIQUES FOR IMPROVING GATE CONTROL OVER TRANSISTOR CHANNEL BY INCREASING EFFECTIVE GATE LENGTH

Title (de)
VERFAHREN ZUR VERBESSERTEN GATE-ANSTEUERUNG ÜBER EINEN TRANSISTORKANAL DURCH ERHÖHUNG DER EFFEKTIVEN GATE-LÄNGE

Title (fr)
TECHNIQUES PERMETTANT D'AMÉLIORER UNE COMMANDE DE GRILLE SUR UN CANAL DE TRANSISTOR PAR AUGMENTATION DE LA LONGUEUR DE GRILLE EFFECTIVE

Publication
EP 3084835 A1 20161026 (EN)

Application
EP 13899916 A 20131218

Priority
US 2013076232 W 20131218

Abstract (en)
[origin: WO2015094244A1] Techniques are disclosed for improving gate control over the channel of a transistor, by increasing the effective electrical gate length (Leff) through deposition of a gate control layer (GCL) at the interfaces of the channel with the source and drain regions. The GCL is a nominally undoped layer (or substantially lower doped layer, relative to the heavily doped S/D fill material) that can be deposited when forming a transistor using replacement S/D deposition. The GCL can be selectively deposited in the S/D cavities after such cavities have been formed and before the heavily doped S/D fill material is deposited. In this manner, the GCL decreases the source and drain underlap (Xud) with the gate stack and further separates the heavily doped source and drain regions. This, in turn, increases the effective electrical gate length (Leff) and improves the control that the gate has over the channel.

IPC 8 full level
H01L 29/78 (2006.01); **H01L 21/336** (2006.01)

CPC (source: EP KR US)
H01L 21/26506 (2013.01 - EP KR US); **H01L 21/3065** (2013.01 - EP KR US); **H01L 21/823814** (2013.01 - EP KR US);
H01L 27/092 (2013.01 - EP KR US); **H01L 29/0673** (2013.01 - US); **H01L 29/1045** (2013.01 - KR); **H01L 29/165** (2013.01 - KR);
H01L 29/401 (2013.01 - EP KR US); **H01L 29/42392** (2013.01 - EP US); **H01L 29/66545** (2013.01 - EP KR US);
H01L 29/66636 (2013.01 - EP KR US); **H01L 29/66795** (2013.01 - EP US); **H01L 29/7833** (2013.01 - KR); **H01L 29/785** (2013.01 - EP US);
H01L 29/78621 (2013.01 - EP US); **H01L 29/78696** (2013.01 - EP US); **H01L 29/1045** (2013.01 - EP US); **H01L 29/165** (2013.01 - EP US);
H01L 29/7833 (2013.01 - EP US)

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)
BA ME

DOCDB simple family (publication)
WO 2015094244 A1 20150625; CN 105723515 A 20160629; CN 105723515 B 20191105; EP 3084835 A1 20161026; EP 3084835 A4 20170802;
KR 102216424 B1 20210217; KR 20160098172 A 20160818; TW 201535533 A 20150916; TW 201730981 A 20170901; TW I590337 B 20170701;
US 10109628 B2 20181023; US 2016240534 A1 20160818

DOCDB simple family (application)
US 2013076232 W 20131218; CN 201380080982 A 20131218; EP 13899916 A 20131218; KR 20167011302 A 20131218;
TW 103139774 A 20141117; TW 106113505 A 20141117; US 201315024258 A 20131218